CONTRIBUTIONS TO PALÆONTOLOGY

II

TWO RODENTS AND A LAGOMORPH FROM THE SESPE OF THE LAS POSAS HILLS, CALIFORNIA

By Robert W. Wilson

With one plate and one text-figure

[Preprinted from Carnegie Institution of Washington Publication No. 453, pages 11 to 17, July 14, 1934]

Daly Graduate School of the Geological Sciences
California Institute of Technology
Pasadena, California

Contribution No. 135

CONTRIBUTIONS TO PALÆONTOLOGY

II

TWO RODENTS AND A LAGOMORPH FROM THE SESPE OF THE LAS POSAS HILLS, CALIFORNIA

By Robert W. Wilson

[Issued July 1934]

CONTENTS

TWO RODENTS AND A LAGOMORPH FROM THE SESPE OF THE LAS POSAS HILLS, CALIFORNIA

INTRODUCTION

One of the largest vertebrate assemblages to be recorded from the Sespe deposits of Southern California, representing an upper Oligocene age, was obtained by the California Institute of Technology in the Las Posas Hills of southern Ventura County. The description of this fauna by Dr. Chester Stock is now in progress.[1] The author of the present paper has been granted the privilege of describing the rodents and lagomorphs from this locality. I wish to thank Dr. Stock, not only for permission to study the material, but for a critical reading of the manuscript. The photographs reproduced in the plate have been carefully retouched by Mr. John L. Ridgway.

DESCRIPTION OF MATERIAL

Sespemys thurstoni n. gen. and n. sp.

Holotype—No. 1397, Calif. Inst. Tech. Coll. Vert. Pale., a fragmentary left ramus with $P\bar{4}$, $M\bar{2}$, and $M\bar{3}$.

Paratype—No. 464, Calif. Inst. Tech. Coll. Vert. Pale., a right ramus with $P\bar{4}$–$M\bar{2}$.

Locality—Kew Quarry, Locality 126, C. I. T. Vert. Pale.

Generic and Specific Characters

Mandibular incisor broad, anterior face flat. Anterior border of masseteric fossa prominent and ridged, terminating beneath the posterior border of $M\bar{1}$. Anterior marginal ridge of lower molars forming the principal element in the anterior crest. Protolophid a minor element in the anterior crest and consisting of a short spur only. Basins of molar teeth shallow and extensive but broken by hypolophid. Hypolophid present as a distinct loph connecting externally with protoconid-hypoconid ridge. Metastylid present in cheek-teeth. Metaconid of $P\bar{4}$, in respect to corresponding cusp in *Ischyromys*, more anterior in position. The species is named in honor of the late James E. Thurston, in appreciation of his important services during the progress of the Sespe excavations.

Description

The ramus in *Sespemys thurstoni* is heavy, especially the anterior portion. The masseteric fossa terminates beneath the posterior border of $M\bar{1}$. The anterior border of the fossa tends to be distinct and ridged. In No. 464

[1] C. Stock, Proc. Nat. Acad. Sci., vol. 18, 550–554, 2 figs., 1932; Carnegie Inst. Wash. Pub. No. 440, art. 3, 15–28, 4 pls., 1933; *ibid*, art. 4, 29–41, 3 pls., 1933.

this character is quite distinct and the fossa is much more pronounced than in *Ischyromys*. The mandibular incisor is broad, and the anterior face is flat, suggesting the Castoridæ and the Geomyidæ, rather than the Sciuridæ.

The fourth lower premolar is subtriangular in outline. The trigonid possesses a rather large metaconid with a smaller protoconid, the two cusps becoming subequal with wear. A short spur extends inward from the protoconid. A fairly strong anteroposterior ridge connects the protoconid and hypoconid. The entoconid is distinct from the hypoconulid ridge, and a loph connects the former with the protoconid-hypoconid ridge. The hypoconulid ridge is strong and runs internally from the hypoconid along the posterior margin of the tooth. In No. 1397, the apparent presence of the hypoconulid is indicated by a swelling in the enamel. The hypoconulid ridge is separated from the entoconid by a sharp valley. A small metastylid is present between the metaconid and entoconid. This cusp shows a variable development in all of the cheek-teeth.

Little difference is to be noted between the first and second molars. The teeth are subquadrate in outline with broad shallow basins, partly interrupted by transverse lophs. A strong, anterior marginal ridge is present, but the protolophid is represented by a small spur only. The metaconid is anterior

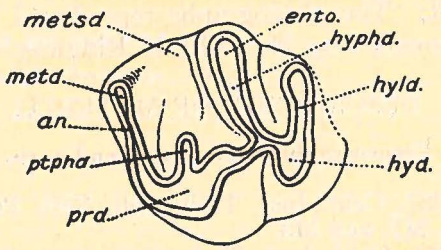


FIG. 1—*Sespemys thurstoni* n. gen. and n. sp. Left $M\bar{2}$, approx. x 9. *Ento.*, entostylid; *hyphd.*, hypolophid; *hyld.*, hypoconulid; *hyd.*, hypoconid; *prd.*, protoconid; *ptphd.*, protolophid; *an.*, anterior marginal ridge; *metd.*, metaconid; *metsd.*, metastylid. These terms do not imply a homology of cusps, but are used simply for convenience.

to the protoconid. A distinct metastylid is present. The entoconid connects with the protoconid-hypoconid ridge by means of a strong hypolophid, but is separated from the well-developed hypoconulid ridge of the hypoconid by a distinct valley.

$M\bar{3}$ is essentially similar to the first two molars. However, the talonid is narrower, the metastylid slightly more distinct, and the metaconid is somewhat more anterior in position.

COMPARISONS

That Nos. 1397 and 464 represent the same species may be subject to some doubt. The masseteric fossa of the former is not so sharply defined, nor is the jaw so deep, at least so far as can be determined in the fragmentary specimen. No differences exist in the molar teeth, but in the fourth lower premolar some differences may prevail, chiefly in the relative size of protoconid with reference to the metaconid. However, it must be stated that the genotype represents a somewhat younger individual than No. 464, and age may therefore account for the apparent differences. Whatever relationships may be indicated by additional material, a comparison of the two existing

specimens hardly yields differences which may be used with certainty, and for the present both are regarded as representing the same species.

The new genus is apparently best assigned to the Ischyromyidæ, as this family is defined by Matthew.[1] The position of the anterior border of the masseteric fossa agrees with that in observed specimens of *Ischyromys*. A distinct entoconid and the imperfect development of crests on a sciurid pattern are additional features which place *Sespemys* in this family. However, in development of the anterior marginal ridge on the lower molars and in the basined character of the cheek-teeth, *Sespemys* seems closer to certain members of the Sciuridæ of Troxell[2] than to *Ischyromys* itself.

The new genus *Sespemys*, when compared with *Ischyromys*, presents the following differences: Masseteric fossa more pronounced, although this character is not well shown in the genotype. Lower incisor much broader. In $P\overline{4}$, entoconid connected to protoconid-hypoconid ridge by a distinct loph; metastylid present; metaconid more anterior in position. In the molars, the principal anterior cross-crest is formed chiefly by the anterior marginal ridge, and not by the protolophid; teeth more basined and basins shallower; metastylid present; cheek-teeth less hypsodont; cross-crests in general not so strongly developed.

Measurements (in millimeters)

	Sespemys thurstoni Genotype No. 1397 C. I. T. Las Posas Sespe	*Sespemys thurstoni* Paratype No. 464 C. I. T. Las Posas Sespe
Length of diastema	.....	6.8 (a)
Depth of ramus below $P\overline{4}$	.....	8.8
I_1 transverse diameter	.....	2.6
$P\overline{4}$, anteroposterior diameter	3.1	3.0
$P\overline{4}$, transverse diameter	2.8	2.8
$M\overline{1}$, anteroposterior diameter	.....	2.5
$M\overline{1}$, transverse diameter	.....	2.9
$M\overline{2}$, anteroposterior diameter	2.6	2.6
$M\overline{2}$, transverse diameter	2.9	3.0
$M\overline{3}$, anteroposterior diameter	2.7	.....
$M\overline{3}$, transverse diameter	2.7	.....
$P\overline{4}$–$M\overline{2}$, alveolar length	.....	8.9
$P\overline{4}$–$M\overline{3}$, alveolar length	12.1 (a)	.....

(a) approximate.

Adequate illustrations or descriptions of the genus *Prosciurus* are unfortunately not available. However, the Sespe form would seem to be generically distinct from *Prosciurus*. The dentition in the latter, as stated by both Matthew and Cope, is rather close to that of *Sciurus*.[3] No mention is made of the presence of a well-developed hypolophid. Cope records the presence of a cusp in the lower molars of *Prosciurus relictus*.[4] This structure may correspond to the distinct entoconid in *Sespemys* or to a metastylid, although it is rather prominent to be the latter. Since Cope states that he first referred the type of *P. relictus* to *Paramys*, a form with distinct entoconids

[1] W. D. Matthew, Bull. Amer. Mus. Nat. Hist., vol. 28, art. 6, 44–45, 1910.
[2] E. L. Troxell, Amer. Jour. Sci., 5th ser., vol. 5, art. 32, 395, fig. 23, 1923.
[3] W. D. Matthew, *ibid*, 63, 1910; E. D. Cope, Report U. S. Geol. Surv. Terr., vol. 3, *Tertiary Vertebrata*, book 1, 816–819, 1884.
[4] E. D. Cope, *ibid*, 818, 1884.

in the lower molars, the former designation may be correct. On the other hand, mesostyles are present in the upper molars of *Prosciurus vetustus* Matthew, and the cusp in question may be somewhat anterior in position for an entoconid. No trace of a hypolophid can be seen in Cope's figure of *P. relictus*.[1]

On the whole, *Sespemys* seems structurally to occupy a position somewhat intermediate between *Ischyromys* and *Sciurus*, but since *Prosciurus*, a more direct ancestor to *Sciurus*, occurs at approximately the same geologic horizon, *Sespemys* can not be regarded as an ancestor of *Sciurus*. Moreover, both *Sespemys* and *Ischyromys* are too far removed from the main line of sciurid evolution to have given rise to forms close to the Recent tree-squirrel. The Las Posas Hills genus possibly represents an aberrant ischyromyid, situated nearer the main line of evolution of the squirrels than *Ischyromys*. A more complete statement must await not only additional material of *Sespemys*, but also a better understanding of the relationships of the early sciuromorphs.

Sciurid? species

A fragment of right ramus with incomplete $P\overline{4}$, No. 1513 C. I. T. Coll. Vert. Pale., represents a sciurid or prosciurid type distinct from *Sespemys thurstoni*. In so far as it can be determined in the fragment available, the masseteric fossa hardly extended forward to a point beneath $M\overline{1}$, but must have terminated posterior to this tooth. This character indicates an ischyromyid, but the incomplete $P\overline{4}$ shows typical sciurid characters. In view of the fragmentary character of the specimen, definite allocation of No. 1513 to the Sciuridæ or to the Ischyromyidæ of Matthew remains somewhat arbitrary. The fourth lower premolar resembles *Sciurus* in general lowness of the cusps. However, in depth of basin and in the identation of the external margin of the tooth, the specimen is perhaps more like other members of the Sciuridæ.

Measurements (in millimeters)

$P\overline{4}$, anteroposterior diameter	1.9
$P\overline{4}$, transverse diameter	1.7

Palæolagus? species

This early lagomorph is represented in the collections from the Las Posas Hills by a single specimen, No. 1512 C. I. T. Coll. Vert. Pale., an incomplete left ramus with $P\overline{3}$ to $M\overline{2}$. Unfortunately, the specimen is so poorly preserved that characters important for its identification are almost wholly lacking.

In No. 1512, the incisor apparently originates below $M\overline{1}$, as in *Palæolagus*. The anterior edge of the masseteric muscle scar is situated beneath $M\overline{2}$. $P\overline{3}$ is in an extremely unsatisfactory state of preservation, but shows one strong external enamel inflection and lacks the small secondary external inflection characteristic of *Archæolagus*. The presence or absence of this inflection may remain uncertain, in view of the preservation of the tooth, but the external wall possesses two ridges instead of three as found in *Archæolagus*. The occlusal surface of the tooth exhibits a structure which may be regarded as an internal enamel inflection, but this is not at all certain. The internal wall of the tooth forms a shallow groove, extending partly down the side, and this may further suggest the presence of an inflection. However, the presence or absence of the internal enamel inflection can not be definitely established. *Palæolagus haydeni* ordinarily exhibits a single external and internal inflection of the enamel in the third lower premolar. With sufficient

[1] E. D. Cope, *ibid*, pl. 65, fig. 35b, 1884.

wear the internal inflection disappears. The external inflection eventually disappears also, except for a groove down the side of the tooth.

The enamel inflections in $P\overline{3}$ of the Las Posas lagomorph occur at about the mid-point of the tooth, dividing it into two semicircular lobes, the posterior one more elliptical, the anterior one apparently slightly drawn out at its anterior tip. The cheek-teeth $P\overline{4}$–$M\overline{2}$ show the posterior lobes joined to the anterior lobes at the buccal borders.

Measurements (in millimeters)

Length of diastema	10.4
Depth of ramus beneath $P\overline{3}$	7.2 (a)
$P\overline{3}$–$M\overline{2}$, alveolar length	8.5
$P\overline{3}$, anteroposterior diameter	1.8
$P\overline{3}$, transverse diameter	1.2
$P\overline{4}$, anteroposterior diameter	1.9
$P\overline{4}$, transverse diameter	2.0
$M\overline{1}$, anteroposterior diameter	2.2
$M\overline{1}$, transverse diameter	2.3
$M\overline{2}$, anteroposterior diameter	2.3
$M\overline{2}$, transverse diameter	2.3

(a) approximate.

Plate 1

Sespemys thurstoni n. gen. and n. sp.

Fig. 1—Fragmentary left ramus with $P\overline{4}$, $M\overline{2}$, and $M\overline{3}$, type specimen, No. 1397 Calif. Inst. Tech. Coll. Vert. Pale. Approx. x 4.

Figs. 2, 2a, and 2b—Right ramus with $P\overline{4}$–$M\overline{2}$, paratype specimen, No. 464 Calif. Inst. Tech. Coll. Vert. Pale. Fig. 2, lateral view, approx. x 1.3; figs. 2a, 2b, occlusal views, approx. x 1.3 and x 5.

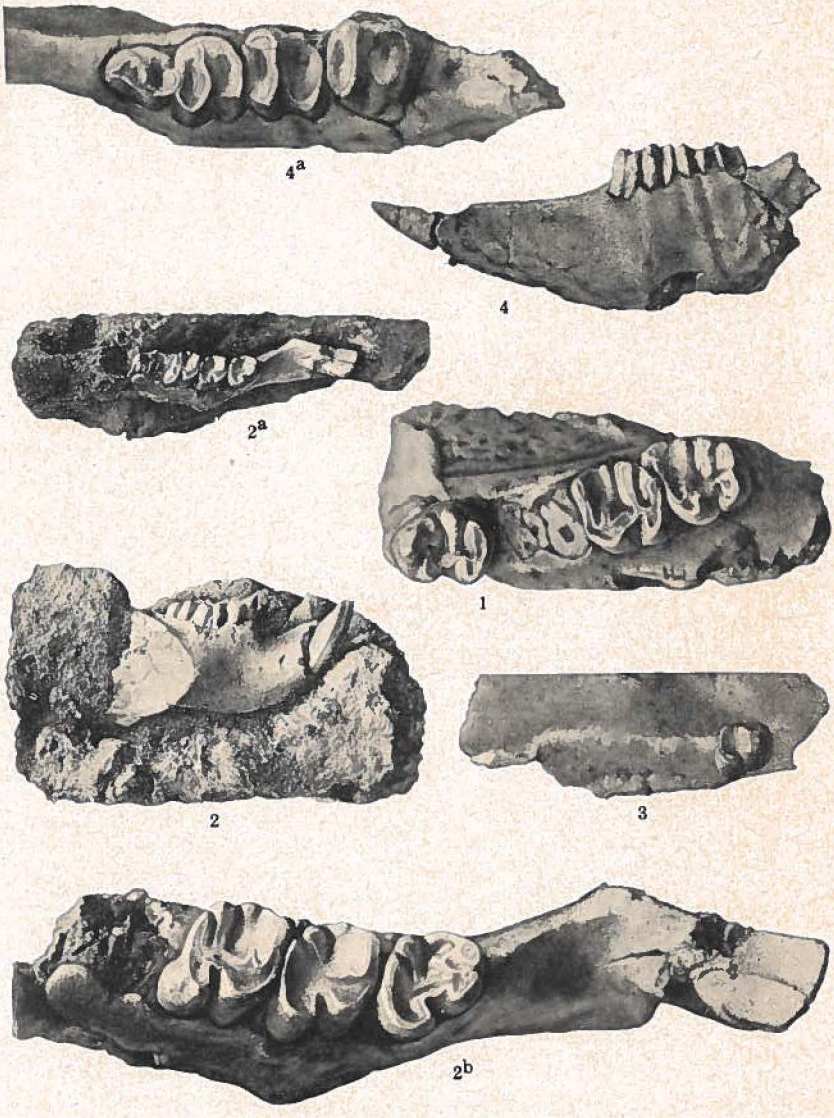
Sciurid? sp.

Fig. 3.—Fragment of right ramus with $P\overline{4}$, No. 1513 Calif. Inst. Tech. Coll. Vert. Pale. Approx. x 4.

Palæolagus? sp.

Figs. 4 and 4a—Fragmentary left ramus with $P\overline{3}$–$M\overline{2}$, No. 1512 Calif. Inst. Tech. Coll. Vert. Pale. Fig. 4, lateral view, approx. x 2; fig. 4a, occlusal view, approx. x 5.

Sespe Oligocene, Las Posas Hills, California.


4a
4
2a
1
2
3
2b